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REPORT OF THE MEETING ON SELECTED BRANCHES OF THE FOOD PROCESSING INDUSTRY IN THE MIDDLE EAST

Beirut, 3 - 6 March 1975

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INTRODUCTION

1. The Meeting on Selected Branches of the Food Processing Industry in the Middle East was held in Beirut, Lebanon, from 3 to 8 March 1975. It was organized under the joint sponsorship of the Economic Commission for Western Asia (ECWA) and the United Nations Industrial Development Organization (UNIDO).

2. Food processing is an important sector in the economy of many countries of the ECWA region and plays a vital role in their industrial and agricultural development and the achievement of a higher degree of self-sufficiency in food production. There has been a growing awareness of the urgency for increased and improved food production highlighted more recently by the World Food Conference held last November in Rome.

3. The purpose of the meeting was to examine, and formulate solutions to the problems presently facing the food processing industry in the countries of the ECWA region as well as to promote its future development including the identification of areas for regional co-operation. In order to achieve practical and specific results, the meeting concentrated on three selected major branches of the food processing industry in the region, namely: (a) sugar; (b) vegetable oils and fats and animal feed; and, (c) fruits and vegetables canning and preservation.

4. Taking part in the meeting were representatives of the Governments of the countries of the ECWA region, the Food and Agriculture Organization of the United Nations (FAO), the World Bank, the Council of Arab Economic Unity, the Industrial Development Centre for Arab States (IDCAS), and a number of international experts in the selected branches.[1/]

1/ A complete list of participants is given in annex I.

5. In advance of the meeting, national consultants and Government officials in the countries of the ECWA region prepared studies on each of the three selected branches in their respective countries. These studies together with a number of documents presented by UNIDO constituted the background papers for the meeting. Papers were also submitted to the meeting by the Council of Arab Economic Unity and the Industrial Development Centre for Arab States.[2/]

6. The international experts acted as technical advisers to the meeting. They introduced the discussions on each of the selected branches, taking into consideration the state of the industry in the countries of the region and in the world as a whole and made proposals for its future development. In addition to the recommendations arrived at during the meeting, the international experts were entrusted with the task of formulating recommendations aimed at individual countries of the region. These recommendations will not form part of this report but will be submitted to the respective countries concerned.

7. The meeting agreed not to elect officers. Mr. W. Moreira-Dias of UNIDO and Mr. G. N. Sfeir of ECWA acted as co-directors of the meeting.

8. This report contains a summary of the discussions and the recommendations of the meeting. The recommendations were reviewed and adopted by the meeting at its closing session.

2/ A list of documents is given in annex II.

I. SUMMARY OF THE DISCUSSIONS

A. Food industry in the Middle East

9. The need for increased food production as a matter of survival was generally emphasized against the present world food situation with severe shortages of food in many regions. It was also noted, that the development of food production in general and food processing industries in particular constituted at the same time an important impetus to economic growth in the developing countries.

10. Considering the detrimental effect of fluctuation in the supply, quality and prices of raw materials, the advisability of developing an integrated food processing industry was emphasized. New food processing projects should be analyzed in the content of the whole product flow from the production of raw materials, post-harvest handling of the raw materials through processing to the distribution and marketing of the end-product. An integrated approach is also called for in the analysis of each stage of food production, e.g. in raw material production consideration has to be given to management and organization of this production, production techniques used including the need for various agricultural inputs, the market conditions for sale of the products, etc. The experience of establishing food processing industries in the countries of the region showed that those projects which failed to take into account this integrated approach to their establishment ended in difficulties.

11. In reviewing the problems faced by the food processing industry in the countries of the region it was generally felt that the inadequate supply of local raw materials constituted the major problem. This referred not only to a generally low supply but to fluctuations in the supply and quality of the raw materials as well. As a result many food processing industries in the region are presently working far below capacity.

12. Apart from the need for a general development of the agricultural sector, it was noted that the inadequate supply of local raw materials for food processing has to be tackled through increased co-operation between raw material producers (farmers) and the food processing industries. Such co-operation would

include assistance to farmers in such matters as the choice of crop varieties, the application of fertilizers, post-harvest handling of raw materials, credit facilities, etc. Furthermore, the resort to advance contracting between farmers and processing industries would ensure more steady supply of agricultural produce to the industries at established prices.

13. As to the proposition that the development of local raw materials sufficiency should precede the establishment of food processing industries, the concensus was that reliance initially on imported raw materials or semi-finished products may be necessary until such time as such sufficiency is attained in view of the fact that the development of agricultural raw materials is often a lengthy process. It was noted in this connection that the establishment of food processing industries often provided a needed incentive to expand and improve local production of raw materials.

14. Specific reference was made to the problem of post-harvest handling of agricultural products. Due to inadequate supporting facilities for such handling, including storage and transportation, waste was inevitable particularly as a result of deterioration in the quality of the raw materials before processing. In this context it was pointed out that for certain products, e.g. fruits and vegetables, the important market is the fresh market, giving the farmers the best prices and also being essential from a nutritional point of view. This emphasizes the need for the development of the necessary physical infrastructure for the post-harvest handling, i.e. storage and transport facilities, and adequate harvesting methods.

15. It was noted that the afore-mentioned integrated approach to the development of food processing stresses the need for active government participation in this development. This need for government participation stems both from the need for over-all development planning of food production as well as the execution of projects which cannot or are not likely to be undertaken by the private sector. This includes the development of physical and administrative infrastructure and in some cases land reclamation, manpower training, credit facilities, etc.

16. Furthermore, government support is necessary for processing industries the need for which also was stressed. Specific mention was made of research

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facilities for developing and adapting food processing technology to local requirements as well as research facilities related to raw materials production.

17. It was pointed out that although the question of labour-intensive versus capital-intensive technology has to be reviewed on a case-by-case basis, it should not be overlooked that the use of modern, highly capital-intensive technology often resulted in a several-fold higher rate of return on invested capital, something that might, through its secondary effects, outweigh the benefits derived from the use of a more labour-intensive technology.

18. Regional co-operation was considered essential in developing the food processing industry. The countries of the region, as well as of the Arab world as a whole, differed significantly as regards the present stage of development of the food processing industry, the development and potential for raw materials production as well as regards the funds available for capital investment. A need was therefore expressed for the fostering of exports of raw materials or semi-finished products from countries with a potential for an agricultural surplus production to those which lack such a potential but have the capital required for establishing processing units. Steps should also be taken in order to enhance the transfer of know-how from countries with a relatively developed food processing industry to those which are less developed in this respect. Several delegates stressed the need for studies on a regional basis of raw material potentials, processing capacities and consumption trends in order to co-ordinate the further development of the food processing industry. Reference was made to earlier and planned studies which could serve as complements to such an over-all study.

19. It was pointed out that in the majority of the countries of the region processing units are at present dependent on imports for much of the raw materials utilized in the three branches under review. No significant trade of such raw materials between the countries of the region was therefore to be expected in the immediate future. In view of this, the need to develop production of agricultural raw materials was further emphasized.

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B. Vegetable fats and oils

20. It was noted that the region as a whole was suffering from a shortage of raw material for vegetable oils and fats processing as well as of insufficient processing capacity to satisfy local demand. Almost all the countries are therefore largely dependent upon imported oils and fats, and/or processing units utilizing imported raw material. Raw material production is generally suffering from low yields and high waste.

21. High priority should therefore be given to increasing raw materials production by improving not only production methods, but also facilities for storage and transportation of raw materials. The increase in raw materials production would also raise the question which varieties of oil seed and other types of raw materials to be grown. In view of the present shortage of raw materials, priority should be given to the production of edible oils and fats, while other raw materials should be used for the production of non-edible prod products such as soap.

22. It was recognized that, in view of the time required to develop local raw material production, many existing processing plants will for the immediate future have to continue to rely on imported raw materials. Experience of processing units relying on locally produced raw materials, before this production had sufficiently developed was generally discouraging.

23. It was noted that the world trend is towards larger processing units and that the units existing in the region often were below or just on level with what is regarded as the minimum economic size. Calculations made by UNIDO showed that the capital investment/ton decreased significantly with the scale of operations. It was therefore suggested that processing be concentrated on larger units. In view of this it was considered advisable that the smaller countries of the region should arrive at some forms of co-operation in the production of vegetable fats and oils in order to achieve economical production. The need to upgrade technology in order to raise productivity and quality, better utilize by-products and give due consideration to environmental aspects was also stressed.

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24. Considering the future market size, which also has a bearing on the choice of the size of the plant, it was noted that the present per capita consumption of vegetable fats and oils is relatively low in comparison with more developed countries and that therefore the market could be expected to expand significantly in the future.

25. The fact that the vegetable fats and oils industry is not only a producer of fats and oils but of protein and animal feed as well should be borne in mind in determining the types of raw materials utilized and the form in which to import them (e.g. crude-oil or oil-seed, where in the latter case a by-product would be animal feed). It was also noted that government policies should re reflect these considerations with regard to the vegetable oils and fats industry. So does for instance a fixed tax per hectare of oil-seed or a uniform import tariff per ton discriminate against the production of low-yielding but protein-rich seeds like soye.

26. The advantages of using non-traditional varieties of raw materials in the countries of the region for vegetable oils and fats processing was considered. The advisability of using palm oil and soya bean was pointed out in view of the significant increase in production of palm oil particularly in South East Asia and the nutritional value of soya bean being an important source of protein both for human consumption and animal feed. The utilization of one of the major raw materials, cotton seed, is limited by the stagnation of cotton's primary market, the textile industry. Olive oil has a strong position in some of the countries of the region, notably in the northern part, and an encouragement of the production of olives was urged by some delegates because of its low soil requirements and the labour intensive nature of its processing.

27. The nutritional criteria in choosing the type of raw material was also emphasized. The choice will therefore be a function of whether it is oil content or nutritional value which is predominant in each case. The possibilities of upgrading the nutritional value through the addition of certain amino acids to the oils produced was also mentioned in this context.

28. It was emphasized that important consideration should be given to the production of animal feed-stuff as a by-product of vegetable oils and fats

processing. The region is presently largely dependent on imports of feed-stuffs and it was stressed that the aim should be to achieve a much lesser dependence on a commodity with such a strategic importance for production of essential food products such as meat and milk. It was also noted that the petroleum resources in the region provided a promising source of producing animal feed through the use of urea as liquid supplement or propylene glycol to replace molasses.

C. Vegetables and fruits canning and preservation

29. Although production and processing of fruits and vegetables are of a considerable size in some countries of the region, the potentials for such production and processing are far from being fully utilized. For many fruits and vegetables it should be possible to reach self-sufficiency or even a surplus for individual countries and in respect to some products for the region as a whole. Prices of imported products can be expected to keep increasing due to increased packaging and handling charges.

30. As in the case of other branches of the food processing industry in the region, one of the basic problems in this branch is the inadequacy and fluctuation of local raw materials both with regard to quantity and quality of supply. Furthermore the use of varieties not suited for processing as well as high prices of raw materials often obtained on the retail market are detrimental to the industry.

31. Among the reasons for the inadequate supply of raw materials the following were mentioned: the generally low yield in raw material production due to the non-modern production techniques employed, short seasons which in combination with high consumer demand for fresh fruits and vegetables left very little surplus for processing and forced the processing industries to purchase raw materials on the retail market on a day-to-day basis, lack of adequate efforts to introduce varieties suited for processing and inadequate facilities for post-harvest handling. It was also pointed out that many of these problems derive from the often insufficient co-operation between farmers and processing industries and from the lack of raw materials specifications and quality control.

32. The question of raw materials is more complicated in the case of fruits and vegetables canning and preservation than in any other food processing industry. This is due to the fact that: (a) the canning and preservation are more dependent on readily available local raw materials; (b) proper post-harvesting facilities and techniques are of utmost importance; and, (c) competition for the supply of raw materials from the fresh produce market. With reference to the latter problem, some cautioned against developing the vegetable and fruits processing industry at the expense of the fresh product market in view of the latter's high nutritional value to the consumer and economic value to the farmer.

33. In view of the above it was suggested that actions had to be taken in the following respects: (a) general improvement of agricultural production including the reclamation of additional arable land; (b) introduction of fruits and vegetables suited for processing; (c) assistance to farmers through advance contracts and technical advice; and (d) analysis and improvement of post-harvesting facilities and techniques.

34. Reference was made to underutilization of capacity of processing plants standing idle for a considerable part of the year due to their reliance upon one or few types of raw materials with a single short season per year. It was suggested that a wider use of a more mixed intake of raw materials together with the introduction of different varieties of the same crop, having different harvesting seasons, would make it possible for the processing plants to operate throughout the year.

35. Besides the problems of raw materials, examples were given of plants working unsatisfactorily due to problems related to other inputs such as water, power, packaging-material and not least skilled manpower. It was stressed that in the planning of new processing plants attention should be given to the above-mentioned inputs.

36. In the planning of new projects attention should also be given to supporting and related industries including the supply of packaging materials, maintenance and repair services and the utilization of by-products.

37. A special problem facing locally produced canned vegetables and fruits is quality and packaging which sometimes do not meet the requirements of international market standards. The need for the standardization of packaging in the Arab countries was also considered desirable. In this connection the inadequacy of existing facilities for local production of packaging material and containers constituted a hindrance to the development of fruits and vegetables processing industries.

38. In view of the drastic increases in transport and freight costs and in view of the often high water content in the canned products it was proposed that one way of regional co-operation could be the production of concentrates in the countries having raw materials for reprocessing in countries lacking raw materials.

39. In any consideration of the future development of the fruits and vegetables processing industry in the region, it was pointed out, due attention should be given first to upgrading existing industries including the solution of the problems they face at present in order to ensure that newly established projects would not face similar problems. Among other, more information should be obtained concerning (a) present modes of production; (b) the possibility of all year round employment of processing units; (c) the possibility of self-sufficiency; (d) prices to the raw material producer; and, (e) factory costs.

40. Several delegates stressed the need for a market study covering both the Arab and the export markets. It was pointed out in this connexion that the weakness in many project studies undertaken in the past was in inadequate assessment of the potential market. However, it was also pointed out that in order to undertake such a market survey efforts had to be directed towards determining exactly what products were being marketed, i.e. analysis of the potential products and their quality and prices. The co-operation of the relevant UN and Arab League organizations was called for in conducting such a market survey. Mention was made by the delegate of the World Bank of a study of the European and Middle East markets planned by the Bank.

41. The existence of rapidly expanding markets which had been largely unexplored by the Middle East producers was pointed out. Specific reference was made to the rapidly expanding East-European market for citrus fruit juices. Reference was also made to the hardening competition in certain other export markets for citrus fruits due to over-production in the Mediterranean countries. Close co-operation between the relatively small producers in the region was considered essential for a more effective penetration of export markets.

42. It was noted that a lasting penetration of export markets requires a steady supply of the products with a competitive quality to those markets which in turn underscores the need for the development of the local raw materials production.

43. In the expansion of this branch, it was suggested that more attention should be given to new products and processes, such as deep-freezing, high concentrates and instant foods, which presently figure only slightly or not at all in the local processing industry.

44. The need for research and training facilities relevant to the development of the vegetable and fruit processing branch was considered essential. Such facilities may have to be provided on a regional basis as many of the countries of the region cannot support individual national research facilities.

D. Sugar industry

45. It was noted that the raw material production and the processing capacity of the Arab countries as a whole fell far short of satisfying local demand. Presently about half of the local consumption is imported, i.e. approximately 1,000,000 tons/year, and the reliance on imports is even higher if import of raw sugar for refining is taken into account.

46. Considering that the present state of the world sugar market is characterized by shortages and rapidly increasing prices - a situation which can be expected to prevail for a considerable time to come - it was agreed that every effort should be made to increase raw materials production and processing capacity for this branch industry.

47. For this purpose, the raw material producing countries of the region, it was pointed out, had a considerable unused potential for substantially increased production. Furthermore, it was pointed out that if some of the sugar cane producing Arab countries, e.g. Egypt, Somalia and Sudan, outside the ECWA region were taken into consideration the potential was even greater. Studies indicate that the latter group of countries may reach a production of 7.5 million tons/year of cane sugar at the end of the century.

48. In examining the raw material production it was recognized that the yield is generally low, sugar beet not of a sufficiently good quality and the supply unpredictable. The underlying reasons for these conditions, it pointed out, were the inadequate agricultural production methods, the lack of proper post-harvesting facilities and the insufficient co-operation between raw material producers and the processing units. In order to achieve increased raw materials production it was necessary to increase both productivity as well as production areas. Studies would have to be undertaken concerning soils, water supply and suitable varieties of crops. Through the introduction of new varieties, with different harvesting seasons, it would be possible to extend the period of processing.

49. The comparative advantages and disadvantages to the use of sugar beet and sugar cane was brought up. It was noted, however, that no general recommendation could be given concerning which of these two crops to use, but that the answer would lie in a country by country and case-by-case analysis.

50. One way to increase the amount of sugar available on the consumer market it was suggested would be to find substitute sweeteners for the various food processing industries presently using sugar as a raw material.

51. It was noted that although local sugar production fell short of local demand, many processing units were not working at full capacity due to inadequate co-ordination between raw materials producers and processing plants.

52. The need for up-grading the level of technology used as well as the imposition of more stringent quality control in order to improve production was generally recognized. It was further noted that sugar refineries in the region were generally of a small size compared to what could be regarded as a minimum economic size.

53. In the above context it was pointed out that a better profitability could be achieved through a better utilization of by-products. Reference was made to the use of molasses for production of yeast, alcohol and citric acid as well as for the use of bagasse for production of paper for packaging material or for production of animal feed. The importance of the latter use was stressed in view of the present reliance on imported animal feedstuffs.

54. The need for a study of the future market and above all the production potentials for sugar within the Arab countries was stressed.

55. Special attention was given to the advantages which could be derived from the new processing techniques whereby so called thick juice is produced as an intermediate step between the raw and the refinery side of the sugar factory.

55a. In the area of regional co-operation, it was suggested that the feasibility of refining raw sugar obtained from countries in the region with raw materials production in countries lacking agricultural produce but with investment capabilities should be investigated.

II. CONCLUSIONS AND RECOMMENDATIONS

56. The following general recommendations pertaining to each of the selected branches of the industry were adopted by the meeting. In addition specific recommendations for the development of these branches in individual countries of the region will be prepared by the international experts on the basis of the country studies submitted by the participants. These will be presented directly to the governments of the countries concerned.

A. Vegetable oils, fats and animal feedstuffs

57. Taking into consideration that:

(i) The target of the Arab countries is to reach self-sufficiency in vegetable oils, fats and animal feed;

(ii) Preliminary estimates[3/] of the increase in production and consumption of vegetable fats and oils in the Arab countries indicate a deficiency of approximately 1,000,000 tons in 1985;

(iii) There are different conditions in the various countries of the region which imply that different types of products are required and different crops can be produced;

and further taking into consideration:

(iv) The period needed for the development of agriculture and production of suitable oil seed varieties;

(v) Existing processing plants, agricultural output and the planned projects in various countries of the region;

(vi) The present constraints on production such as insufficient skilled labour, standards, high cost of production, and inadequate storage and transportation facilities.

58. IT WAS GENERALLY AGREED THAT:

(i) Consideration should be given as needed to the reorganization and extension of existing plants, and feasibility studies carried out

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3/ The Oil and Fat Industry in the Arab Countries (Status, Problems, Development Methods), Industrial Development Centre for Arab States (IDCAS).

for the establishment of new plants, having in mind adaptability of the plant to extension and integration, economy of scale and modern technology, and its suitability to local conditions.

(ii) A master plan for the development of the production of vegetable oils, fats and feed in the Arab countries, based on country by country studies, be prepared.

(iii) Existing studies related to local markets and production should be up-dated and analyzed in detail, thus forming the basis for the required studies.

(iv) Agronomical research in prospective areas must be intensified to identify the most promising areas and the right type of seed with the highest yield possible and most suitable for processing.

(v) The production development of all suitable types of oil-bearing seeds - cotton seed, soya bean, ground nuts, rape seed, sesame, sunflower, etc. - should be investigated or intensified in the light of local cultivation conditions and their economic value as a source for oil and other essential products such as proteins, animal feed, fibres, etc.

(vi) Palm oil which can be processed very economically by fractionation and refining thus obtaining a base for shortening or ghee substitute and avoiding the very expensive hydrogenating process may continue to be an important imported raw material until such time as self-sufficiency of locally produced seed has been achieved.

(vii) The olive oil industry is an important constituent of the economy in several countries of the region because it is labour intensive and is native to these countries. The industry suffers from fragmentation, harvesting difficulties and low processing techniques. Reorganization is required to up-grade the agronomical conditions and yield with due consideration to socio-economic aspects.

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(viii) The production of other edible products from oils and fats, such as margarine, with good nutritional specifications and long shelf-life should be encouraged as a substitute for imported butter. Precaution should be taken to avoid the production of synthesized oils, such as esterified oils and similar ingredients, for human consumption.

(ix) Although the development of the vegetable oil industry would promote the production of animal feed, feasibility studies on the production of protein from petroleum should be initiated.

(x) Utilization of vegetable oil by-products as well as technical grade animal fats (tallow, lard, etc.) should be emphasized in order to create other industries as for example soap manufacture so as to minimize reliance on edible qualities of oils and fats for technical purposes.

(xi) The development of chemicals and chemical packaging materials for this branch industry should be considered in the light of the demand, economy of scale and availability of raw material.

(xii) Co-operation among the Arab countries for the realization of the master plan and implementation of the development programmes is essential. As the implementation of the master plan depends on the individual programmes of the various countries, co-ordination of development plans is also essential.

(xiii) Joint development programmes and enterprises should be promoted under bilateral agreements between member states and/or through the efforts of the Council of Arab Economic Unity.

(xiv) Co-ordinating machinery should be created to assist the countries to elaborate and implement the master plan, including feasibility studies, training schemes, standards, research and studies, etc. Such machinery would incorporate existing research institutes and other appropriate bodies assisted by international and regional organizations such as ECWA, UNIDO, FAO, IBRD, IDCAS, the Arab Organization for Standardization and Metrology, and the Arab Organization for Agricultural Development.

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Co-operation with international institutions specialized in olive oil and other vegetable oils should be established.

(xv) Co-operation among countries in the region should provide for assistance from those with longer experience in the vegetable oil industry to others with less experience.

(xvi) Financial institutions may be called upon to promote various programmes and specific projects which lead towards the development of this industry.

B. Vegetables and fruits canning and preservation

59. Taking into consideration that:

(i) The Arab countries' target in this sector, is self-sufficiency, eliminate unnecessary imports and maximise exports;

(ii) Most of the existing plants are not organized on modern agro-industrial lines;

(iii) Existing process plants are not working to capacity;

(iv) Further large process plants have been planned;

(v) There is an over-all shortage of raw material;

(vi) Regional production is often of unsuitable varieties and the tonnage out-turn per hectare is very low;

(vii) There is little organized agricultural production under contract to guarantee:

a. Supplies of consistent quality produce to the process plant throughout the production period;

b. A guaranteed remunerative price to the producers of raw material backed by regular agronomical assistance and advice;

c. Prices and supplies of raw materials are, under the present system, dependent on the demand in local fresh markets.

(viii) There is lack of co-ordination between producers of raw materials and the industrial sector;

(ix) This lack of co-ordination leads, among others, to heavy losses through waste in handling of raw materials;

(x) In consequence the cost of raw materials is high and the processed product can be both sub-standard and costly;

(xi) The supply of packaging material is costly and irregular;

(xii) Inadequate planning of factories and lack of proper implementation contribute to low productivity;

(xiii) Marketing and distribution techniques are inadequate;

(xiv) There is a shortage of skilled personnel at all levels and lack of adequate training facilities.

60. IT WAS GENERALLY AGREED THAT:

(i) An integrated approach should be taken in strengthening existing production and further development of this sector on a modern basis, taking into consideration both the countries' and the regional interests.

(ii) Co-ordinated planning at all levels and in all contexts should be followed to take full advantage of latest technological developments. Careful planning at the outset will ensure maximum efficiency and avoid future mistakes which can be very costly.

(iii) Up-dated market research, utilizing existing studies should be conducted into the Arab and world-wide markets for various types of produce.

(iv) Agronomical research in prospective areas must be carried out to identify the most promising areas, the right varieties with the highest possible yield, and most suitable for processing. Adequate attention must be paid to soil analysis, local environmental conditions, irrigation, the use of desalinated water, use of fertilizers and pest control. Extension of the season of production is essential.

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(v) Research must be effected into packaging with special emphasis on the maximum usage of local materials and introduction of plastics, foils and other forms of packing. Package manufacturing plants should co-ordinate supplies of packages to all local industries. Requirements of individual packages be fully investigated with reference to e.g. lacquer, seaming, closures, etc. A feasibility study for the establishment of large scale, modern manufacturing of packaging materials should be undertaken. The sizes and types of packages should be standardized in order to effect economies both of production and storage.

(vi) Full advantage must be taken of available information on modern storage methods for dehydrated, perishable and semi-processed products to avoid wastage, deterioration and unnecessary handling.

(vii) Efficient transportation means and networks must be created to ensure prompt delivery of raw materials collected from producers and delivery of finished products to buyers.

(viii) Training of adequate personnel at all levels, with availability of extension officers is vital.

(ix) Investigation should be undertaken in order to promote the development in the region of products and processes such as refrigeration and cold-chain facilities, deep freezing, dehydration, instant food, high concentrates, convenience foods, and baby foods. Special attention should be paid to the development of industrial processing of traditional foods.

(x) In order to assist the Arab countries in planning and implementing programmes for expansion, reorganization and modernization of the fruit and vegetable processing industry, an institutional framework should be organized making use of existing institutions and, where necessary, by strengthening them or creating new bodies. The following institutions were specifically mentioned: packaging institute, producers union, training institute, standards institute, and marketing board. Government support to the strengthening or

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or creation of such institutions was considered essential and it was also agreed that institutions should have the full support of international and regional organizations such as ECWA, UNIDO, FAO, the Arab Organization for Standardization and Metrology and the Arab Organization for Agricultural Development.

C. Sugar industry

61. Taking into consideration that:

(i) Sugar is a strategic commodity;

(ii) High imports make it vital to increase the production of the region;

(iii) There is a world shortage of sugar which induces high prices;

(iv) There is a tendency to increased consumption throughout the world with which supply is unlikely to keep pace;

(v) Acute shortage could possibly lead to a situation where supplies would not be available regardless of the availability of funds. The consumer would therefore be deprived of a basic commodity;

(vi) The sugar industry is vital in providing an essential ingredient to allied industries and also in the production of by-products;

(vii) In an agro-industrial context, this industry is a very important factor in employment at all levels;

(viii) This industry offers vast scope for co-operation within the Arab world especially as semi-finished products can be economically transported to be finished in countries lacking raw materials;

And further taking into consideration:

(ix) Existing processing plants, agricultural output and the planned projects in various countries of the region;

(x) The actual constraints on production, insufficient skilled labour, standards, high cost of production, storage and transportation facilities;

(xi) Existing studies and experience reveal that there is a great potential for increased production of raw materials in the region.

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62. IT WAS GENERALLY AGREED THAT:

(i) Immediate action should be taken to improve the productivity of the existing processing plants and to increase the production capacity of the region.

(ii) In view of the time required to increase raw materials production, the possibility of establishing processing units operating with imported raw materials but which can be extended to fully integrated plants where adequate local raw materials will be produced, should be investigated.

(iii) In order to bridge the gap between production and consumption in the region and to eventually decrease the heavy reliance on imports, a significant increase in the raw materials production within the Arab countries has eventually to be achieved.

(iv) To arrive at an increased production of raw materials, agronomical research in depth is necessary in prospective areas to identify the most promising areas, the right type of varieties with the highest yield possible and maximum sugar content. Due attention must be paid to water requirements and availability.

(v) Consideration should be given to the possibility to reduce the rotational crop cycle time in sugar beet growing. Special reference was made to successful results obtained from growing sugar beet in cycle with certain protein rich crops, e.g. soya bean.

(vi) In the planning of processing plants, the following factors must be taken into consideration:

a. The economy of modern technology indicates that processing plants should be of the maximum size consistent with the projected volume of raw materials available. The size of the plant should ensure prompt processing of raw materials to avoid waste due to deteriorating sugar content.

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b. The possibility of multi-seasonal cultivation of sugar beet, where the environmental conditions permit, should be investigated in order to make possible an increased utilization of the processing plants.

c. The location of the plant should ensure a minimum delay between harvesting and processing of the raw material. It is important that full consideration should be given to maximum efficiency in harvesting and transport, emphasizing shorter harvesting campaigns.

d. Full consideration must be given to the latest technological developments in the production of thick juices. The advantages of this product are:

- The raw material process can be shortened without the necessity of a large expansion of the refining plant and hence capital investment is reduced;
- Losses are reduced through prompt handling of raw material;
- The semi-processed product can be handled and transported in bulk;
- The product is available to strategically located refineries;
- Allied industries can benefit from the availability of a low price, good quality product easily handled and stored.
- Supply of thick juice produced from either sugar cane or beet can be handled by the same refinery.

(vii) Full consideration must be given to the processing of by-products in order to:

a. Increase the profitability of sugar production;

b. Provide a basis for the establishment of industries utilizing these by-products, taking full advantage of such by-products as bagasse in the manufacture of pulp and paper, and an ingredient in animal feed and making full use of molasses, sugar syrup and date juice for recovering sugar and production of liquid sugar, citric acid, yeast, alcohol and liquid supplement for animal feed.

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c. Achieve a greater degree of self-sufficiency in such essential products as animal feed.

(viii) In order to reduce wastage of sugar the possibility of utilizing substitute sweeteners in food processing should be fully investigated and policies concerning the distribution and pricing of sugar should be closely examined.

(ix) Co-operation among countries for the realization of research and planning and implementation of the development programme is essential.

(x) As the implementation of plans depends on the individual programmes of the various countries, co-ordination of development plans is also essential.

(xi) Joint development programmes and enterprises should be promoted under bilateral agreements between member states and/or through the efforts of the Council of Arab Economic Unity.

(xii) A programme should be initiated for:

a. the reconstruction of the existing sugar industry;

b. the establishment of new processing units;

A programme as outlined above should incorporate existing research institutes and other appropriate bodies assisted by international and regional organizations such as ECWA, UNIDO, FAO, IDCAS, Arab Organization for Standardization and Metrology and the Arab Organization for Agricultural Development.

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LIST OF DOCUMENTS

Title	Symbol
Provisional schedule of meetings	E/ECWA/ID/WG.3/INF.1
Schedule of meetings	E/ECWA/ID/WG.3/INF.1/Rev.1
Information to participants	E/ECWA/ID/WG.3/INF.2
Provisional list of participants	E/ECWA/ID/WG.3/INF.3
List of participants	E/ECWA/ID/WG.3/INF.3/Rev.1
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Re-establishment of tomato-paste industry project in the People's Democratic Republic of Yemen	E/ECWA/ID/WG.3/1
Vegetable oils and fats and animal feed industries in Lebanon	E/ECWA/ID/WG.3/2
Sugar industry in the Syrian Arab Republic	E/ECWA/ID/WG.3/3
Food processing industry in Jordan	E/ECWA/ID/WG.3/4
The sugar industry in Lebanon	E/ECWA/ID/WG.3/5
Canned fruits and vegetable products industry in Lebanon	E/ECWA/ID/WG.3/6
A study on vegetable fats and oils and animal feed industry in the Syrian Arab Republic	E/ECWA/ID/WG.3/7
Food canning industry in Iraq	E/ECWA/ID/WG.3/8
Study on food processing in the Kingdom of Saudi Arabia	E/ECWA/ID/WG.3/9
Country report on fats and oils in Iraq	E/ECWA/ID/WG.3/10
The canning industry "conserva" in Syria	E/ECWA/ID/WG.3/11
Development of the food industry in the Middle East countries	E/ECWA/ID/WG.3/12
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